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MR. SWAN'S NEW CARBON PROCESS.

We are now in a position to place the details of Mr. Swan's new carbon printing process before our readers. A complete description with working details, was given to one of the fullest meetings of the Photographic Society we remember to have seen, on Tuesday evening last, and the capabilities of the system illustrated by a few dozens of specimens, all of first class excellence, including portraiture, landscape, and marine subjects, from card size to ten by eight. Every specimen exhibited fully justified the admiration we have already expressed in regard to the productions of the process. Some of the delicate instantaneous views from negatives by Mr. Wilson were exquisitely beautiful, as were also the portraits. Of the large pictures, Mr. Bedford, who was in the chair, remarked that they were as perfect as it was possible for photographs to be, possessing every quality which could be desired, and, as he added after the meeting, they were not simply equal to silver prints, but superior to them, possessing a general briilliancy, a delicacy of detail and transparency not to be found in the best silver prints. The description of the process was lucid and simple, and was received with attention and frequent applause. A severe fussillade of questions from various persons, some of which at times assumed an unnecessary air of antagonism, only served to elucidate the subject and confirm the general high appreciation of the process.

Mr. Swan has availed himself of the existing agents and many of the known facts in regard to carbon printing, and combined

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these to produce as perfct in result and ingenious in its details as can well be conceived. With existing agents he has produced a new material which just meets the requirements of the case, and whilst, at the first glance, the method may suggest difficulty and and complexity from the complete novelty of some of the operations, yet a closer intimacy with its details, such as we acquired in a ten hours' scarcely interrupted conversation with him on the subject, convinces us that it is as simple and easy as almost any other process in photography. We will proceed to describe it, however without further preface.

Mr. Swan's first step is to make sheets of a new material, upon which to produce his picture, consisting of collodion on one side, and gelatine, sugar, bichromate of ammonia, and pigment on the other, which we will call *sensitive pigmented collodio-gelatine.*

He proceeds as follows:—Take

Gelatine	4 ounces.
Water	16 "

Let the gelatine soak in the water, cold, and then dissolve with gentle heat. Next add the white of an egg, well beaten; mix with the gelatine solution, boil, and filter. This is simply a fining process, the coagulating albumen collecting and carrying down with it any impurities in the gelatine, leaving a brilliantly clear solution. Any loss in quantity is now made up by the addition of water, and then add—

White sugar	2 ounces.

The solution is now ready for receiving the coloring matter. This, in the majority Mr. Swan's experiments, has been the finest form of carbon, namely, indian ink. But it is a noteworthy fact that any permanent pigment may be used, of which there are many of various tints. Every tone of monochrome may therefore be secured, black, bistre, sepia, &c., &c. Indian ink modified in tint by slight addition of other pigments, answers, however, admirable, and gives a considerable range of tone. The pigment has got into solution by soaking or rubbing down, and after filtration, to get rid of any coarseness, sufficient is added to give the solution the right depth of color, a point only to be learned by experience and observation, no definite quantites as yet being assignable, for various reasons. This pigmented gelatine is now ready for use, and may be preserved almost indefinitely in well stoppered bottles. Now take

Bichromate of ammonia	1 ounce.
Water	3 ounces.

Of this solution add one ounce to from eight to ten ounces of the gelatine solution. Thus rendered sensitive, it is better used within a day or two, and the preparation should not be heated higher than about 100 Fah., which is quite sufficient to keep it fluid.

Next take plain collodion of good body, coat a cleaned sheet of plate glass, and allow it to set and desiccate perfectly. These plates may be kept ready coated for use. Now warm one of these plates, coat the collodion film with the sensitive gelatine solution, and place the plate on a levelled stand to prevent the solution running in an unequal thickness to one end, and allow it to remain until the solution is quite set; the time will vary with the temperature, a few hours being sufficient in a warm room. When quite dry, it may be stripped off the glass by running the point of a penknife round the edge, and presents a black, pliant material, very similar in appearance to a piece of the black enamelled leather sometimes used for glass positives, and similar in substance to what are generally termed ivory cards. By transmitted light this tissue is translucent, notwithstanding the presence of the pigment; and by examining it in this stage the experienced eye will readily judge whether the proper proportion of the pigment is present. The tissue is now ready for printing, and must, we need scarcely say be kept in the dark, and used within a day or two. All the operations with the sensitive gelatine preparation will also be performed, of course in the dark.

In the next stage, the principle now well recognized, first published by J. C. Burnett, generally attributed to Mr. Blair,* is carried out. We refer to the necessity of allowing the light to reach the sensitive surface, as it were, from the under side. Mr. Swan had recognized this principle before he had seen it published, but did not succeed in any application of it. Mr. Burnett and Mr. Blair published it, and Fargier, Pouncy, and others have successfully applied it, and now Mr. Swan applies it with still greater efficiency. We need not dwell upon its philosophy now, further than to say that if a coating of gelatine on glass or paper be exposed to light, the whole of the surface acted upon becomes insoluble, the insolubility proceeding downwards into the texture in the direct ratio of the action of light. The shadows would probably be rendered so all through, the half-tones half through, whilst the lights remain quite soluble. It will readily be seen that when the whole shall be submitted to a soaking process to clear away the soluble portions, as the lower layer of gelatine under the half-tones is soluble, when it is washed away it will carry with it the upper half which has been rendered insoluble, so that the only portion remaining is that acted upon through its whole substance forming the shadows. The issue of this is, as all persons familiar with carbon processes know, an image without any half-tone. If, however, the light have passed through the glass or paper holding the gelatine, so as to act on the under surface first, then the upper surface may be washed away. leaving the half-tone attached to the glass or paper in just such proportion as it has been rendered insoluble, for it must be remembered that the gradations of depth are here obtained by a process similar to giving washes of different depths in water-color drawing. A thick layer of pigmented gelatine giving a deep black, a thin layer giving a grey, and so on. It follows that, in proportion to the thickness of the layers rendered insoluble by light will be the gradation in the picture. A negative with twenty gradations in intensity will allow just as many gradations in the thickness of the layer of colored gelatine, and therefore the same number of gradations of middle tone in the picture.

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* It is quite probable that to each of these gentlemen the discovery may have been made independently ; but Mr. Burnett published the idea, explaining its working very clearly, in November, 1858, and Mr. Blair not until January, 1859.

Mr. Swan then takes his tissue and places its collodion surface in contact with the negative, so that the gelatine in contact with the collodion is acted upon first. The exposure takes place in the pressure-frame, as usual, and the time of exposure varies with negative and light; but with this tissue not more than from one-third to one-fourth of the time necessary for silver printing is required. It is not quite so easy to determine when a print has been sufficiently exposed as with silver printing, although a per ceptible image is formed. Mr. Swan says that experience is readily acquired, and that, moreover, much greater latitude is permissible than with silver printing. About five minutes in a good light would be sufficient with a good negative, whilst the same picture would not be irredeemably spoiled with eight, or even ten minutes.

After exposure the picture is mounted on paper before further proceeding, either starch paste, or an india-rubber cement being being used When dry, it is placed in warm water, at a temperature of 100 Fah. This is practically a developing process : the soluble gelatine and pigment are rapidly cleared away, leaving the insoluble layer in its several gradations attached to the collodion, and revealing a charming picture. Three or four changes of water are desirable to remove all the bichromate, and Mr Swan prefers the prints to soak about a couple of hours. If the picture be over-exposed, a prolonged soaking and higher temperature will provide a remedy to some extent. The necessary soaking and washing do not make the film leave the paper to which it was attached.

A perfect carbon print on paper is now completed; but if it be left on the paper as it is, and have been printed from an ordinary negative the image is reversed. Many of the beautiful specimens we have seen are just in this condition. In subjects in which the strict preservation of right and left are unimportant, there is no reason for making a change. But where the right relation in this respect are important, another step is necessary. The print should in this case have been attached to the paper with the indian-rubber cement; and after reaching the stage we have described, it is to be mounted again, picture side downwards, on suitable paper with starch paste, and when dry, the first paper to which it was attached is simply lifted off, coming away without any difficulty. The picture is then complete, collodion side uppermost, with right and left in their true relations. If the last result be desired without the trouble of the last process, the use of a reversed, or transferred negative, as described in Mr. Swan's paper, will effect the result.

Having thus stated the general details of the process, we must defer pointing out some of its special peculiarities and advantages until next week, merely remarking that it has some especial advantages of its own beyond absolute permanency. For instance, it is possible by the process to secure from a hard negative a soft print, and a vigorous print from a weak negative, this control over the result existing here to a much greater degree than in silver printing. The general tendency, indeed, of the process is to raise the character of photographic printing as well as of photographic prints. We mean it will give greater scope for the exercise of judgment and skill, and demand a high class of intelligence for the production of its highest results. This we consider a merit rather than a disadvantage, and we believe that amongst the highest class of photographers it will rapidly supersede silver printing altogether, if they endorse the remark of one of our first portraitists, that with such a process at all within the possibility of commercial operations, silver printing would be a dishonest practice.

Mr. Swan's first impulse was to give his process to the world. More experienced counsels induced him to protect it by patent. He has, therefore, secured it in this country, the various States of Europe, and in America. His liberality has still induced him to give photographers the earliest information of its details, although the law would have permitted him to retain his secret for six months, and make his commercial arrangements by showing results in the meantime. He prefers to make the process known before making commercial bargains. The precise details of these arrangements are not yet determinately fixed; but, unless the patent passes out of his hands, his intentions are very liberal. He will not seek, by obtaining large sums from a few individuals, to limit the utility of his process; but rather seeks his remuneration by imposing a nominal tax upon the many. He contemplates the payment of a small premium, and the subsequent charge of something like a farthing a picture from professional photographers, requiring that each print by his process sold shall have a small stamp or design affixed, which he will supply at something like like twenty shillings a thousand. In order to avoid limiting the scope of experimental photography, or placing bounds upon progress, he proposes to place the process in the hands of amateurs unfettered, who may practice the process without any charge, so long as they do not make it a matter of trade, as he only stipulates for sharing profits made out of his invention. These arrangements are, however, not specifically determined, and must be received with the qualification of uncertainty. Should they be carried out, we see a fortune for the earliest professional printers who shall undertake to print by this method for amateurs and the profession.

In the meantime, Mr. Swan, in connection with his partner, Mr. Mawson, proposes to enter at once into the manufacture and supply of the various preparations, advancing them to the furthest stage compatible with keeping conditions, in order that experimentalists may proceed to work with the best aids to success, and the least possible preliminary trouble.—*Photo. News.*

THE MANAGEMENT OF SITTERS.

BY DAVID DUNCAN.

It is, no doubt, presumptuous on my part to attempt to teach what has already been taught before by such able photographers as M. Disderi and others; but I think that the subject still receives too little attention from many operators, skillful though they may be in the dark room. I have seen clever manipulators, and good chemists withal, entirely out of their element in the studio; they have gone about posing the sitter nervously, and have been fidgetty in the extreme, hovering here, and dodging there, working the sitter into a state of mind and body, in which he was utterly unable to keep still, to say nothing of retaining control over the expression.

Moreover, photographers' assistants sometimes get themselves into disgrace with their sitters, from no other cause but want of management. I have known them insolent, &c, because they would not allow the sitter to retain an ungainly position, but had not the tact to secure the right position, without irritating the sitter. Of course, I do not say that such occurs every day, or with every operator, but none will deny that such is sometimes the case, and that some sitters are almost insupportable, and will persist in placing themselves in a most inartistic position. Will not a corpulent lady or gentleman persist in sitting direct facing the lens, simply because he or she desires to be taken "full face"? if you have light only on one side of your studio, will not some people, with blue eyes, insist on being taken facing the light, and look indignant because you cannot permit them to be so taken? And does it not sometimes happen, that an affected young man, or old maid, will persist in holding a white handkerchief in a most affected and ludicrous manner? because " books are so very formal." I have met with such, and earnestly entreated them to put their handkerchiefs in their pockets, and the moment I have put my head under the focussing cloth, I have seen the hand steal towards the pocket and the offensive mass of white has again been held in a furtive manner, the surreptitious act often giving an unpleasant expression to the face, as might be expected. I may go further, and state that some persons, who perhaps have come for their second or third re-sitting, will persist in such things, and will keep moving in every plate you expose. This will most frequently happen when you have several sitters waiting, and thus make you terribly behind hand with your appointments. Well, perhaps some photographer would say, " When I meet with such sitters as the above, I first take them their way, and next request them to sit mine, and then show them the difference." It is a very good plan, but not always convenient, especially if you are busy. I am not going to attempt to give advice, yet I say, use a little management with your sitter; perhaps attention might be given to the following.

Immediately a sitter enters the studio, begin to place him or her in position; have the plate so far in advance that you can do so; at any rate do not keep the sitter waiting. Think at once of the position, whether a sitting or standing position is best suited to them; go about posing them in an easy and gentlemanly manner; if they are talkative, talk to them, working the while; do not bustle about in placing accessories, and avoid walking to and from the sitter as much as possible; in short, work as easy and as *quickly* as you can.

Should a lady or gentleman be awkward in getting in the position you desire, show them by placing yourself in position, in an unhesitating or nervous manner. Nothing is worse than 'screwing' round the sitter's head, or "moulding them," as it were, into a good *pose*, albeit you must have command over your sitters to a certain extent. In fact, as Lord Chesterfield wrote, unite "gentleness of manners with firmness of head."

It is always as well, when convenient, to show the negatives. In conclusion, I think that photographic portraiture requires a peculiar amount of tact, somewhat different to other businesses, and the management of the sitter is better imagined than described; but if a little attention is given to that point, it will materially facilitate business, and photographers' assistants will have the satisfaction sometimes accorded the writer, of a lady or gentlemen on leaving the studio, saying, "Good morning, sir; I thank you for your courtesy."—*Photo. News.*

PHOTOGRAPHIC LENSES.

BY J. T. TAYLOR.

[Read at a meeting of the Photographic Society of Scotland, April 12, 1864.]

In the first part of this paper, which was read before this Society upwards of a year ago, when treating of portrait lenses, the subjects of astigmation, over and under correction, &c., were also considered. Hints were also given now to ascertain if a lens had been properly achromatized for photographic purposes and rules for finding the equivalent focus of a combination. Bearing these in mind, we now proceed to consider, in an equally discursive manner, the subject of Landscape Lenses—a subject which, it is reasonable to suppose, is possessed of more interest to amateurs than that of lenses solely intended for portraiture.

If a plano-convex achromatic lens be mounted—without any stop—in a camera, it will be found thot when the convex side is turned outwards an image of a certain degree of sharpness will be obtained in the ground-glass, but that such sharpness will be confined to a very limited portion of the plate. A good telescopic object-glass reproduces objects in its axial line with great intensity, and for the purpose of taking a distant object with the greatest possible rapidity and sharpness a lens of that form might be employed, but it would have this disadvantage, that the angle of view reproduced with proper definition would be extremely limited—for instance, not over one degree, except for photographing such an object as the moon; and it would be consequently useless to the photographer who requires his lens to include from thirty to sixty degrees. If the plano-convex lens alluded to be so mounted as to present the flat surface to the view, there being still no diaphragm or stop in the tube, it will be seen that, although the field is much flatter, no one part is now sharp. This is caused by the property known as spherical aberration—that is, the tendency of the edge of a lens to bend or refract an incident ray to a greater extent falling on the edge than on the centre of the lens. In a single achromatic landscape-lens spherical aberration is got rid of—at least to an extent great enough for practical purposes—by putting a diaphragm or stop at a certain distance in front of the lens. In tracing the course of oblique rays after passing through a lens, it is found that good definition coupled with maximum flatness of field, can only be obtained when the edge of the lens is employed in forming the edge of the picture, and the centre of the lens similarly employed in the formation of the central portions of the picture. Without a stop, all is haze and confusion; but immediately the stop is inserted, sharpness and approximate flatness of field are the results.

I have often heard it said—"Seeing such a small aperture is employed in forming the front of a landscape lens, why not employ a very small lens without a stop before it?" If the foregoing be not considered a sufficient answer, I would further reply—"Just try the comparative merits of a picture taken with a stop at the proper place, with one taken when the stop has been pushed up in close contact with the lens so as to make it in effect a lens of the diameter of the aperture in the stop, and I warrant that the result of the comparison will be such as to satisfy any one that there is indeed a vast difference." Whatever the diameter of the lens employed—though it be no larger than a pea—there must be a diaphragm in front of it, if the best-defined and flattest picture possible to be obtained from such a lens be desired. You will observe that a question of large *versus* small lenses, raised some time since by Sir David Brewster, does not apply in the case of the diameter of view-lenses, which are all supposed to have a small stop in front where the rays cross, but is rather applicable to lenses so constructed as to work with full aperture, such as portrait-lenses. The peculiar doctrine of Sir David Brewster alluded to, although a good deal misunderstood at the time, and even so now, is held by many acquainted with the higher branches of optics as incontrovertible. Among those whom I have heard speak in somewhat decided terms of the correctness of Sir David Brewster's doctrine is Mr. Shadbolt the chief editor of *The British Journal of Photography.*

I should have remarked that the best general form of a view-lens is the periscopic or meniscus form. A view-lens of the kind now described will give excellent definition, embrace an angle of tolerable width, and be altogether unobjectionable as a landscape lens; but when employed for architectural or other similar subjects, it will be found that straight lines in the original are represented by slightly curved ones in the photograph, this curvature becoming more apparent according to their distance from the centre of the picture. When only a limited angle of view is embraced, this kind of distortion, although existing, may not be appreciable to the eye; but when a larger angle of view is embraced or the lens comes to be overtasked, then the curvature of the pseudo straight lines becomes more and more apparent.

It would encroach too much upon time at present to enter into the cause of this distortion. Let it suffice to say that this kind of distortion is inherent in all single lenses with a stop in front, and has its foundation in the fact that the edge of the lens refracts more than the centre. Generally, the smaller the diameter of the lens the less of this peculiar kind of distortion there will be; and if a view of a building be taken with the stop in its ordinary place, and compared with another having the stop placed very much closer to the lens—the stop at the same time having a sufficiently small aperture to render the view equally sharp with the other—it will be found that the curvature of the lines of the building is diminished in proportion as the effective diameter of the lens has been diminished.

The practical lesson to be derived from this appears to be, when taking a general landscape, use the stop in its normal position; but when taking a building or any other subject in which the curvature on the ground-glass is apparent, use a smaller stop at a smaller distance from the lens.

All that has been said about the ordinary view-lens applies to that peculiar form known in commerce as the aplanatic lens, the difference between them consisting in the method by which they are corrected. For these peculiar differences, I refer you to the blackboard on which I have drawn both. I have on the table several aplanatic and other view-lenses, but with the experience I at present have of their working, I am unable to institute a comparison between them; in the meantime I am unable to discover any points of superiority possessed by one over the other.

To obviate the curvature produced by the meniscus lens, Prof. Petzval devised a compound lens which was intended to reproduce objects with accuracy. This is known sevarally, by the names of "orthoscopic," "orthographic," "caloscopic," &c., lens, the principle of construction being alike in all.

This lens includes a large achromatic toward the front of the tube, and a smaller one behind it. The front lens is a cemented achromatic; the back one is not cemented, and is concave in its character. It lengthens the focus of the front one, flattens the field, and is intended to cure the distortion alluded to. As the lens is usually constructed, however, it overdoes this, producing a kind of distortion of the sand-glass kind, indeed of an exactly opposite nature to that produced by the old-fashioned lens. There is perhaps no lens extant that is of such an accommodating nature as this one. Just let me describe the properties of the individual lens now submitted for inspection. It occupies, as you see, a quarter-plate mount, with Waterhouse diaphragms. The focus measured from the back lens is about fifteen inches, and the size of plate covered, when the smallest stop is used, is twelve by fourteen inches. When used without any stop whatever, with an aperture (that of the smaller or back lens) of one and a half inch, it gives beautiful, crisp definition, flat of course only on a limited size of plate, but with such freedom from astigmation as to allow of a group to be taken on a twelve by ten plate with full aperture. Theory, they say, has decided that it is impossible to take a picture with this class of lens having the marginal lines free from curvature. I have only to say, "so much the worse for theory," for this lens is gives pictures in which it is impossible to detect any curvature.

When the glasses are arranged as I now show you, the lens suddenly possessed of a new property, which is the much-disputed one of depth of focus, or, more strictly, depth of definition, covering a large field flat without any stop whatever. The fine, crisp definition which in its original position it had is gone; it now gives a picture *generally sharp* all over the plate, but particularly sharp nowhere. In short, it has no real focus at all. For many subjects, however, this is rather advantageous than otherwise, as one may not care at all times to take a picture microscopically sharp; and when for pictorial effect this peculiar kind of definition is desired, it is better to obtain it by giving the lens a little aberration in this way than by the more common manner of putting the subject a little out of focus; for by this latter method, if the middle distance be out of focus, there is a chance of the foreground or background being still in sharp focus, and *vice versa.*

Mr. Fox Talbot at the time of his great discovery seemed to be aware of the importance of occasionally securing a certain degree of degradation of the sharpness in certain subjects, portraiture among others. The plan long ago recommended by him for this purpose, but now apparently forgotten by many, was to insert betweee the negative and the sensitive paper one or more sheets of uniformly dense paper. This method is still worthy the consideration of photographers. When the lens before us is so adjusted as to give perfect freedom from distortion, the picture produced by it is generally otherwise inferior to what it produces when so arranged as to give slight distortion of the sand-glass character. I should state that this distortion—when the lens is adjusted to its best condition for landscape purposes—although it does exist, is of such a slight nature as to prevent its being detected on a moderately sized plate unless by strict measurement.

Were a comparison to be instituted between the orthosopic and ordinary view-lenses as to their respective merits for field-work, I would say without hesitation that the old form of lens is the better.

In the Mechanics' Magazine for, I think, 1847 or 1848, there was an account of a lens which gave perfect freedom from distortion, besides possessing other advantages. It consisted of two meniscus lenses, one at each end of a tube, the convex sides out, with a stop between. This, as you are aware, answers in a general way the description of the Harrison globe lens. The globe lens seems to have found more favor across the Atlantic than in our country. Having only examined one of those lenses, I am not in a position to say much about it It seems to include an angle of considerable width, and reproduces subjects free from distortion. A very small stop is required. The lenses are placed at such a distance as to make the two convex surfaces portions of a sphere or globe, from which the name is derived. You will see that the axial pencil is not only wider than the oblique pencil, but it has also a shorter distance to travel to the ground-glass; the consequence of which is that the centre of the picture is much more illuminated than the extreme edges. This, I am aware, is the case with all lenses having circular apertures in the diaphragms; but the defect is more noticeable in this lens than in any other, from the great obliquity at which the ray passes through a circular hole in a flat plate. With such a lens equality of illumination can only be secured in one or other of these two ways—either by means of Sutton's "butterfly" or equalizing stop, in which the oblique pencil is as large as the axial one, or by still retaining the ordinary diaphragm, and constructing the crown-glass lenses of such a green color as to cause, by its greater resistance to the light when passing through the thick crown glass in the centre, a retardation sufficient to compensate for the more feeble action of the attenuated oblique pencils. Mr. Bow, civil engineer, was the first to polnt out this useful property in colored crown glass, and he has followed it up by a mathematical investigation of this subject, the results of which he has published.

The present paper being of an undue length, I fear I shall have to inflict on the Society at some future time a third chapter of which Triplet and Panoramic Lenses will form the subject.

PFRMANENT PRINTING PROCESS.

The fact is well known, and it has been acknowledged again and again, that all photographs produced by the ordinary silver process, will sooner or later fade away. This was admitted as far back as the foundation of the Duc de Luyne's prize, in the conditions of which it was stated, that carbon or printing ink was the only material that could be relied on for permanency; it being, therefore, most desirable to obtain photographs in the above durable material, our French neighbors have rewarded accordingly those who have worked in this direction, thence it was that Mr. Pouncy obtained, in Paris, a silver medal and 400 francs for his first carbon proofs. From about the same time the Editor of *Photographic Notes*, who keenly appreciates the importance of a carbon printing process, or a move in that direction, has not ceased to keep the point continually before the world. After numbers of persons had obtained particulars of the process from Mr. Pouncy, and produced by means of it photographs in carbon, the London Photographic Society called a meeting to consider the subject. But although from time to time since the appearance of the first carbon photographs by Mr Pouncy, others have worked in this direction, yet the Photographic Society of London has never offered any medal, reward, or encouragement of any kind for the production of a photograph on the permanency of which we may rely. Not so with the Photographic Society of Scotland, for amongst the medals offered last year by that body, of which Sir David Brewster is the President, was a medal for the best print in carbon or printing ink, and that medal was awarded to Mr. Pouncy of Dorchester.

Now, although we have heard of late something about a new carbon process by Mr. Swan, whose pictures are pronounced by the Photographic Society "to be equal to silver," still, there is no reward offered for photographs in carbon. Like the gentleman who exclaimed in discussion, " What do we as photographers want with pictures ?" So the Photographic Society would seem to indicate by inaction. "What do we want with permanent photographs ?" Again, I ask, what is there to induce an enlightened public to go to a photographic exhibition ? Can we not see in almost every street, in any one of our large towns as well as in London, every description of photograph, yet it is only amongst the few that we can perceive any advance in the art of permanent photographic printing, so that our friends after us may possess our unfading cartes de visite. Yet, even those few are carefully excluded from the encouragement of the Photographic Society. I must say I feel therefore rather surprised that amongst the number enumerated in your impression of 18th March, whom you consider to have been excluded from the chance of gaining medals, you should have expressed no sympathy for those who are laboring might and main to elevate photography by a method of printing, by which alone the work of photography of this generation can be handed down to the next; let us ask, where can one see any of those taken by by Mr. Fenton detailing the scenes of the late Crimean War—those prints which were exhibited at that time? I should be glad to see some of them at the forthcoming Exhibtion, and the council would do well to offer a medal for their production there, in order to show the public what they have to expect from any photographs in silver, or what satisfactory evidence exists in proof of their permanency. I think the council might have spared themselves the unnecessary eaution exhibited in Rule 4th, viz., that pictures which have already been publicly exhibited will not be received.

I should like much to see that case of photographs that ever was shown at the two exhibitions; surely such a thing has not yet happened, nor is it likely to do so while the method of silver printing continues. It is notorious that many exhibitors removed from the walls their photographs on account of fading, long before the close of the late International Exhibition, and yet in the full knowledge of the state of these things, the London Photographic Society, by their arrangement, exclude all those from sharing its honors who have brought forward a permanent process; surely it must be patent to all that so-called honors of so partial a description are utterly worthless, and canaot prove more enduring than the works that form their subjects. H. D.

Weymouth.

[We noticed the omission of any mention of a carbon or permanent printing process, to a gentleman officially connected with the Photographic Society, and he intimated that he believed a power would rest with the jurors of awarding or suggesting the reward of a medal for any permanent printing process of which worthy specimens might be exhibited. We thought it strange that no direct offer of a medal for such a process should be made, but refrained from allusion to the subject in our strictures, as it appeared possible that some recognition of merit in that direction might still be made, whilst in the cases we condemned their appeared evidence of intentional slight.]—Ed. *Photo. News.*

Photographs have recently been made by means of the light from burning magnesium wire. The only difficulty in the way of the practical use of the light, is its great cost.

ALKALINE DEVELOPMENT FOR WET PLATES.

BY THOMAS SUTTON.

In the number of this Journal for March 15th, (see Am. Journ. p. 458,) we described a New Wet Collodion Process, in which the image is developed by an alkaline solution of pyrogallic acid instead of by the common acid solution of protosulphate of iron. But experience has taught that in bringing forward any new process in photography it is not enough to indicate those steps which lead to success; you must also discuss the various failures which are likely to occur, but above all that particular failure to which the process described is especially liable. We will endeavor, therefore, in the present article to treat some of those failures which have occurred in our own experience with alkaline development.

Every photographic process has its own peculiar kind of failure. For instance, the wet iodized collodion process, with pyrogallic development, has a tendency to give dense hard negatives and insensitive films;—the wet bromo-iodized collodion process, with iron development, has a tendency to give thin, grey negatives, which yield poor, flat prints;—the dry Tannin process, with acid development, is excessively slow, and has a tendency to give a great deal of clear glass and dense black in the negative, which yields of course a disagreeable black and white print; and so on through all photographic processes. You may succeed probably with nearly every one that has been proposed, when the conditions are favorable; but they all have their peculiar tendency to go wrong in some particular way; and when any new process is brought forward that particular tendency should be frankly stated, and the way to counteract it pointed out.

In the alkaline development, either of a wet or dry plate, there is no doubt a tendency to fog; and even the very best negatives which can be taken in this way are slightly veiled, and show no details by reflected light, although by transmitted light the veil is not perceived, and the negative will yield the finest possible print. This veil does not, however, occur in the development until the negative is being intensified by acid pyrogallo-nitrate of silver; and then, if conditions are unfavorable, it ruins the picture. We have therefore to point out the cause of this evil, and show how it may be avoided, or reduced to a minimum.

Fogging in this process may proceed either from bad manipulation, or a bad state of the nitrate bath.

When the chemicals are in perfect order, bad manipulation may nevertheless produce fogging, and the mischief then arises from one of the following causes, viz.: either the film has not been sufficiently washed to remove the free nitrate of silver, or it has not been sufficiently washed to remove the alkaline developer before the intensifying mixture is poured over it. Every intelligent photographer must be aware that imperfect washing of the film in *any* stage in which washing is necessary, must lead to failure, and his own instinct will prompt him to wash the film thoroughly from one solution before another is applied to it, which would, if mixed with the former one produce muddy turbidity. It is almost an insult to the common sense of our readers to tell them that the plate cannot possibly be washed too much after its removal from the nitrate bath, or after the alkaline developer has done its work upon it; whereas it *may* be washed too little, and then failure will arise as a matter of course. But it may be necessary to give some definite idea of what is meant by "sufficient washing" Suppose then a small stereoscopic plate is removed from the nitrate bath, left for five minutes in water in which a dozen similar plates have been previously soaked, and then a pint of water poured over it from a jug, that would be sufficient washing; but it is the very least which the plate ought to receive; a pint of water at least should also be poured over it after treatment with the alkaline developer.

Having thus pointed out an obvious cause of failure, which is only likely to occur in the hands of a slovenly manipulator, we have next to deal with another cause of failure which is clearly traceable to a bad state of the nitrate bath.

When the chemicals are all good, and the nitrate bath new and fresh, everything works beautifully, and you can hardly go wrong; but when the bath is old, and overcharged with organic matter and double salts of silver, (although its strength may be kept up to the right point by the addition of fresh silver,) it is very liable to give foggy, miserable negatives, and the best plan then is t throw it down with salt and make another. In this state of the bath it may sometimes happen that the first picture you take in it, after it has rested for some hours, may turn out well, but all succeeding ones badly. Moreover, in order to prove that it is really the bath, and not the other chemicals which are at fault, you have only to try the same collodion in a new bath, and all will go right. It is impossible, in the present state of our knowledge of the double salts and organic compounds of silver which are formed in an old bath, to explain the chemistry of its action, and why it produces fog with alkaline development, but it is very important to know for a fact that it *does* act badly, and therefore those who wish to give our new process a new trial should certainly make a new bath for that express purpose with the best recrystalized nitrate of silver.

And now we come to another cause of failure, viz.: comparative insensitiveness of the film. Take, for instance, a new bath in good working order, and try with it various samples of collodion, some old and some new, some colored and some colorless; you will find various degrees of sensitiveness in the film, according to the collodion employed; and it may be stated as a general rule that new colorless bromo-iodised, made with pure methylic ether, gives the *most* sensitive films, and old red iodised collodion the *least* sensitive. But this difference does not seem to depend entirely upon the liberation of nitric acid in the film in consequence of the free iodine in the colored samples of collodion, but upon some other cause; because it is an undoubted fact, that nitric acid may be added to the bath, even to the extent of two minims to the ounce of solution, without diminishing the sensitiveness of the film. These facts show how very little is known for certain in the chemistry of photography; but being undoubted facts, we have to adapt our practice to them.

There may be other causes of failure, arising from the use of empirical preparations of collodion, and bad chemicals, of which we know, nothing. It is more than three years since we used any other than pure recrystallized nitrate of silver for the bath; and if we ever use an empirical collodion made by a secret formula, it is simply for the purpose of an occasional comparative experiment with collodion made by ourselves with purified solvents, and by our own published formulæ. Without therefore saying a word in disparagement of any of the collodions in the market, we must still be excused from attempting to analyse or account for any possible failures which may arise from their use. We only profess to point out such failure as may occur when the same chemicals are used which we use ourselves. It is not at all improbable, in fact it is nearly certain, that the collodion and bath which many of our readers may be employing with tolerable success in the common wet process with iron development, will be found unsuitable for the new wet process with alkaline development; and if they wish to give the new process a fair trial, our advice is to procure a sample of Mr. Bailey's purified methylic bromo-iodised collodion, and a tube of his pure recrystallized nitrate of silver for that express purpose. By doing this we shall be able to compare notes with them, and probably with mutual advantage.

And now let it be not supposed that because we have fairly discussed such failures as are likely to occur in the alkaline development of wet plates, we are not still earnestly advocating the merits of that mode of development. On the contrary, we are so charmed with it that we employ now no other process; and the negatives which we are taking by it, both upon wet and dry plates, are being sent continually to Mr. Ross as specimens for the inspection of the curious. Altogether we have sent to England nearly a hundred negatives developed with alkaline pyro, and they have been generally admired. Three of these are upon glass bowls 10-ins. diameter, and including 120° of angle in every direction; and be it remembered this is a style of negative which it would be impossible to develop in the usual way, without producing stains upon the picture.

The veil which alkaline-developed negatives always exhibit, more or less, is only superficial in successful cases, and it merely hides the details by reflected light without impairing the clearness and brilliancy of the lights when looked through. Nothing is finer than a good negative taken in this way, and it is remarkable for the inestimable quality of fulness of detail, with a wide scale of gradation perfect in every tone. We can compare these negatives to good ones upon waxed-paper, but without any of the faults of the latter, The prints which they yield are especially remarkable for softness, being free from that common defect of photographs excessive blackness and unnatural vigor. It is this style of negative which produces the most artistic prints,—and this style of print which, if it were to become general, would raise photography greatly in the estimation of artists and gentlemen of taste. By this admirable process, you obtain softness without flatness—vigor without hardness—and all the delicacy which a washed film alone can confer. It is also the most sensitive of all known collodion processes, and that which at the same time allows the greatest latitude in the time of exposure. We commend it to the earnest attention of every one of our readers, whether professional or amateur—*Photo. Notes.*

INTERESTING PHOTO-CHEMICAL DISCOVERIES.

At a recent meeting of the Manchester Literary and Philosophical Society, Prof. Roscoe exhibited the light emitted by burning a portion of a fine specimen of pure magnesium wire 1 mm. in diameter and 10-ft. long, which had been manufactured by Mr. Sonstadt. Prof. Bunsen, and the speaker, had examined the photo-chemical action of the sun compared with that of a terrestrial source of light, and for the purpose of this comparison they chose the light evolved by the combustion of magnesium wire They showed that a burning surface of magnesium which, seen from a point at the sea's level, has an apparent magnitude equal to that of the sun, effects on that point the same chemical action as the sun would do when shining from a cloudlesss sky at a height of 9 deg. 53 min. above the horizon. On comparing the chemical with the visible brightness of the sun's disc, as measured by the eye when the sun's zenith distance was 67 deg. 22 min., is 524·7 times as great as that of the burning magnesium wire, whilst at the same zenith distance the chemical brightness of the sun is only 36·6 times as great. Hence the value of this light as a source of the chemically active rays for photographic purposes becomes at once apparent. The extract from the memoir referred to is as follows :—"The steady and equable light evolved by magnesium wire burning in the air, and the immense chemical action thus produced, render this source of light valuable as a simple means of obtaining a given amount of illumination expressed in terms of our management of light. * * * The combustion of magnesium constitutes so definite and simple a source of light for the purpose of photo-chemical measurement, that the wide distribution of this metal becomes desirable. The application of this metal as a source of light may even become of technical importance. A burning magnesium wire of the thickness 0·207 millimetre evolves, according to measurement we have made, as much light as 74 stearine candles, of which five go to the pound. If this light lasted one minute, 0·987 metre of wire, weighing 0·1204-grm. would be burnt. In order to produce a light equal te 74 stearine candles burning for ten hours whereby about twenty pounds of stearine is consumed, 72 2-grms. of magnesium would be required. The magnesium wire can be easily prepared by forcing out the metal from a heated steel press having a fine opening at the bottom; this wire might be rolled up in coils on a spindle, which could be made to revolve by clockwork, and thus the end of the wire, guided by passing through a groove, or between rollers could be continually pushed forward into a gas or spirit-lamp flame, in which it would burn." Professor Roscoe stated that great credit was due to Mr. Sonstadt for the able manner in which he had brought the difficult subject of the metallurgy of magnesium into the present satisfactory position, and expressed his opinion that, even for photographic purposes, the application of the metal will prove most important. Mr.Brothers, Mr. Parry, and other photographers present, corroborated Dr. Roscoe's opinion respecting the value of such a source of light for photography. Since the meeting, Mr. Brothers made an experiment upon the magnesium light, which he reports as follows :—"The result of an experiment I have just tried is that in fifty seconds with the magnesium light, I have obtained a good negative copy of an engraving, the copy being made in a darkened room. Another copy was made in the usual way in daylight, and in fifty seconds the result was about equal to the negative taken by the artificial light. The sun was shining, but there was a good deal of fog in the atmosphere.—*Manchester Guardian.*

The contributions of the Photographical Society to the late Fair were successful and valuable. No pictures at the Fair were so much sought for; none brought so good prices. The contributions would have been doubled if a little more time had been given.

Editorial Department.

———The news has come again to-day (14th) that Gen. Grant is moving on the enemy's works. This is the cheering news we have had every day for more than a week. We expect to hear it again and again till it shall culminate in the tidings of the glorious and final victory.

And what then? We answer as a photographer only. There are many millions of civilized people who have not had the opportunity to put their faces to paper or glass for three years. When the opportunity returns will they have lost their desires? Depend upon it there will be a cry of 'operators wanted.' Manufacturers may again start the engine, and crowd on the steam. We shall see again in the metallic state those substances, silver and gold, which were bidding fair to become mythical. New fields for enterprise! A thousand new photographic establishments are to be opened this year. And be assured good friends that this Journal follows in the march of our armies; we expect to send at least a dozen copies to the city of Richmond, and half a dozen to Charleston, before the year is ended.

We believe these are now about to come to pass for the reason as intimated above, that an earnest and skillful soldier is really moving on the enemy's works.

———Congress proposes shortly to exact a tax of two cents on each and every photograph which shall be sold after the passage of the law. We fear the rate is too high. Cards of celebrities are sold to the trade at four dollars per hundred and less; the tax in that case will constitute one-third of the cost. Ordinary *cartes de visite* are produced at from $1 to $6 per dozen, and in this case the tax will be a good share of the cost. Might not photographs almost come under the category of newspapers and books, and thus justly be almost exempt from taxation. But the photographers are patriotic men and will pay their taxes as cheerfully as any other class. The new tax will not seem so burdensome as that which has quadrupled the price of alcohol and ether.

———Mr. W. G. Helsby writes to the *News* of April 8th, that he has used the hot silver bath for printing, as described on page 382 of this Journal, and finds it has the following advantages:—

"Saving in time in silvering—saving of time in printing—saving of time in toning—entire absence of mealiness and uniformity of color in the prints."

He also adds:—

"I may also mention that, when the bath solutions are well mixed, you require only to keep up the original quantities of the working bath from the stock solution, to keep it in working order."

We have heard no unfavorable report from those who have tried the process in America; we are inclined to think that it isworthy of adoption especially by those who make printing a distinct business.

———Owing to a misunderstanding of the wrapper writer of the last two numbers a few copies were not mailed. Thisis an accident which has never occurred before and we trust it is the last. We discovered the error by the reasonable complaint of subscribers. If there are still more who have not been served, if they will kindly advise us, the missing Nos. will be sent at once. There need be no fear whatever that the thing will happen again.

Minor Correspondence.

F. W., of Pa.—" 1. In what proportions do you think best to mix the new developer. 2. My albumen paper bothers me some by blistering, and turns brown by fuming with ammonia. 3. Do you think it best to fume albumen paper?" .... 1. Photographers of experience do not follow any exact formula for developer; but vary proportions to suit the condition of the bath or collodion. We decidedly approve of this plan. For ordinary work we suggest: double sulphate 1 oz., acetic acid 3 ozs.. water 20 ozs. ..2. The turning brown is probably owing to fuming before the paper is dry. Get the paper thoroughly dry, and in our opinion the paper will remain perfectly white. ..3. We use the fuming process, and recommend it to all.

J. A. W.—"I am a subscriber to the Journal, and see a great many new ideas that interest me, but there is one thing I would like to have you make a move in; try and induce the manufacturers of calico to give us a photographic calico for the million, instead of that abominable zebra goods for Hoosiers, great sprawling figures and zebra stripes that are horrible in a picture. What we want is a maroon or brown plain dark color for the poor class to have to get their pictures taken in. We live in the agricultural districts and norice this mere than you do. I used to live in Boston, Mass., and followed the profession of portrait painter, and I see the need of a reform here. It would be such a relief to my eyes to see some plain, dark, warm calico, and the goods wonld sell as a novelty as photographic calico, and people of taste would buy it in preference to the old style." ....A very good idea, and we think it possible that some enterprising calico printer may put it in practical shape. Will some of our subscribers in the neighborhood of print works please talk it up to the proprietors?

M. H. M., of N. Y.—"I have a lot of deposit which has been accumulating for some time at the bottom of my waste pipe in the cellar, the bottom of the drain is of boards, and I scraped up the deposit which is a mixture of sand, a black powder when dried; my washings of plates have been allowed to go into said drains for years, andnow there is three or four pails-full of this. Do you think it would be worth while to try to get the silver out of it?" ....The deposit without doubt contains silver, and probably enough for profitable extraction. If all the ordinary photographic washings be mixed together, the silver would be completely precipitated. The amount which would remain in waste pipes of a sink would depend mainly upon the rapidity of the current. Enough silver is constantly going down sinks to handsomely support a nabob.

H. B., of N. Y.—"If it will not be imposing on your good nature I wonld like to ask a few questions in regard to the achromatic lens. What is the way or manner of measuring for making a lens of the above description, or, more plainly speaking, the best or shortest way of making a lens of that description that will be a good worker." ....You do indeed call for too much information. We could easier instruct you in the art of building meeting houses.

O. S. Follet.—In a recent letter concerning his new business, this gentleman writes:—"I have been compelled by reason of the many orders crowding upon me for Shaw's Silver and Gold Saving Apparatus, to leave the employ of Messrs. Scovill Manufacturing Co., with whom I have been during the past five years in order to devote more time to this branch of my business, and trust now that my undivided attention can be applied toward the same, to fill many orders which I have received through the circulation of my former advertisement in your valuable Journal.

Sylvester Roe of Flushing, offers a new plan of restoring a disordered bath. He adds to the bath contained in a suitable bottle about 10 per cent. of water. The bottle with its contents he now places in a kettle of water and heats to boiling, and continues the boiling for some time. The bath turns red in the operation, but on cooling and filtering, it becomes clear and bright, and will be cured of its freaks. The process seems to us reasodable. We hope it will be tested.

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From Locket to Mammoth size. These Cameras are of the most superior quality, and are subjected to the most thorough test before being offered for sale. Our new

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Is attached to the 8-4 and Mammoth size; and we do not hesitate to pronounce them SUPERIOR TO ANY OTHER IN USE.

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To carry out this plan, and at the same time to assure parties that they will be perfectly secure respecting their just share of the amount so recovered, I have associated myself with a responsible party well known to a large proportion of the Photographers throughout the United States. I have therefore placed the entire management of the business in the hands of Mr. O. S. FOLLETT, (with SCOVILLE MF'G CO.,) No. 4 BEEKMAN STREET, NEW YORK. All orders must be sent of his address, as above given.

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Extra 1-2	do	do	28 00	33 00
4-4	do	do	45 00	50 00
Extra 4-4	do	do	80 00	85 00
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The 1-4, 1-3 and 1-2 size Cameras can be furnished in matched pairs of exactly the same length focus for Cartes de Visite and Stereoscopic pictures, without extra charge.

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It is the most **compact and convenient** printing frame in existence.

It is the **easiest to handle.**

It allows the **inspection of all parts** of the print by opening one portion of the press.

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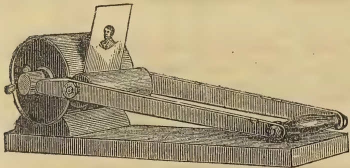

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The construction of the Press is shown by the accompanying wood cut. The polishing, or glazing, is effected by the small roller, and the necessary pressure is obtained by means of the screws attached to the ends of the lever that are passed through the journal of the large roll.

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Is unsurpassed for the **Harmony, Delicacy and Strength** of the negatives which it invariably gives under the usual treatment. The great excellency of the Collodion is mainly due to the **Gun Cotton,** and the **Pure Iodides and Bromides** which enter into its composition, as well as to the recipe after which it is manufactured.

In addition to his stock of chemicals, the subscriber is constantly supplied with the very best **Photographic Paper**, plain and albumenized.

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CHEMIST,
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Patentee and Sole Manufacturer,

442 Broadway, New York, and Lancaster, O.

These plates are now admitted, by disinterested parties, to be

THE ONLY PERFECTLY RELIABLE IRON PLATES.

the *very best* materials are used in their manufacture, (notwithstanding the extraordinary advance in prices during the past year,) upon a formula modified and materially improved since the issuing of letters patent. **ROUGH IRON** and **BENZINE VARNISH,** (the two principle constituents of the cheap imitations of the Ferrotype Plates, with which the country has lately been flooded, to the annoyance and loss of confiding purchasers,) have been found to be **Wholly Unfit** for purposes of positive photography. I have abundant evidence before me that these abortions have about *had their day.*

The public is more clamorous than ever for the Ferrotype Plates!

They are the SINE QUA NON, in the estimation of the numerous experts who are familiar with them.

There is scarcely an ambrotypist or photographer in the country who has not heard, or beheld in glaring capitals, this sentence :

"Warranted equal to the Ferrotype Plates!"

Indeed, this phrase has become stereotyped in the mouths of persons who have something to recommend as a substitute for my plates. What does it mean? Does it not *slightly* indicate that the Ferrotype Plates are held in the **HIGHEST ESTIMATION**, not only by the photographic fraternity, but even by the makers and venders of *would-be* rival plates? Does it not indicate further that my plates represent the standard desirable to attain, in order to win the **substantial favors** of consumers? I, therefore, **solicit your orders,** confident that you will find my plates, on trial, to justify the assumptions herein set forth.

For the benefit of persons not yet acquainted with the merits of my plates, I will name some of their points of superiority :

1st. Excellence of the materials used in their manufacture. **2d. Perfect Cleanliness** of the plates from newly opened boxes. **3d. Beauty of Surface. 4th. Ease of Manipulation. 5th. Quick-working qualities. 6th. Safety and Satisfaction** in their use. **7th. Susceptibility of being used Repeatedly,** with uniformly good results. **8th. Adaptibility to all latitudes.**

My plates are all guaranteed, and are sold at prices, by the single box, which make them, considering their excellence, the **Cheapest Plates in Market,** as follows :

Light.		**Heavy.**	
1-9 per box of 8 doz...	**$0.75**	**1-4 per box of 8 doz...**	**$2.25**
1-6 " " ...	**1.25**	**1-2 " 4 ...**	**2.50**
1-4 " " ...	**2.00**	**4-4 " " ...**	**5.50**

Stock Dealers will be allowed a liberal discount from the above prices, Where $10 worth of plates are ordered at one time, I will make no charge for collection by Express Co. On receipt of fifteen cents in postage stamps, I will forward sample plates by mail. Orders addressed to

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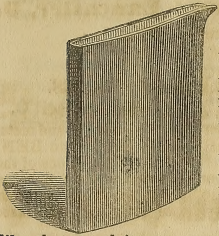
MATHIOT'S PATENT

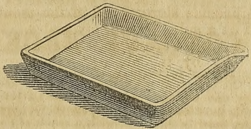
Photographic Ware Baths,



Made expressly for the purpose of holding strong acid and silver solutions. They can be had of five different sizes. They are found to possess every qualification that can be called for, besides innumerable advantages over any other in use.

They hold the least quantity of solution, being made very thin. They will not burst and let out the silver solution like the gutta percha bath. They will not turn the solution black, as will the rubber bath. They will not check like the porcelain, nor crack from changes of temperature like the glass baths. They are entirely impervious to all acids, will withstand all atmospheric changes, are made by a scientific man on scientific principles, and will last a lifetime. Is anything more required of a bath?

DISHES! DISHES! DISHES!



The Photographic Ware Baths have such a popularity that the manufacturers, in order to oblige numerous customers, got up their new style of

PHOTOGRAPHIC WARE DISHES.

Since their first introduction, a year since, the demand for these popular Dishes has been very large. Their advantages are patent. They will not crack or check, and they are entirely impervious to all acid solutions. They are very strong, and will last for years. Do not fail to order them.

Extract from the London "Dictionary of Photography," (by Thoms Sutton, Esq., the Editor of "Photographic Notes,") page 131:

* * * * "Porcelain Baths are very objectionable, as nitrate of silver acts on the glaze. There is a substance used in America for baths and dishes called PHOTOGRAPHIC WARE, which resembles WEDGEWOOD WARE, and has no glaze; this answers the purpose admirably.

Extract from the "British Journal of Photography."

* * * * "We have used porcelain, white earthenware, and glass Baths. The first and last met the general approval except in the quality of high price. We were the first to abandon gutta percha. At present, the most popular Bath is known as the Photographic Ware, an invention of George Mathiot.

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